Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.6, No.14, 2015
www.iiste.org

Adequate Environmental Monitoring a Sinequanon for Sustainable Development

ALONI CLINTON (1) ALEXANDER BUDNUKA CHINAGO (2) OTEH OZULE CHARLES (3)
Department of Social Sciences, Rivers State College of Arts and Sciences, Rumuola, Port Harcourt.
Igenetus Ajuru University of Education, Rumuorlumeni, Port Harcourt.

Abstact.
Environment sustainability requires constant and regular observation of on-going activities within the environment, maintained through an enhanced environmental standard, using documents that set the rules, guidelines and numeric values defined by the involved parties likely to have impact on the state of the environment, because man has through his interferences and exploitations introduced more gases, dumped waste, altered weather conditions and micro- climates or encouraged devastating wind erosion, flooding, gulling, pollution of air, water and soil, hence the increasing population and the noticeable resultant resources scarcity encouraged explorations around the world that awakened the framework for a global system of observation stations that emerged which provides the basis for understanding the world today, and thus the need for global monitoring through the application of a range of technologies. The wok observed that environmental impact assessment though important is not enough. The work suggested that strategic environmental assessment be carried out instead of just impact assessment. To this end, the work states that explicit and systematic checking of outputs and outcomes related to a management initiative in order to understand what works and what does not work, and to determine needed modifications to enhance effectiveness. That is the ideal or spirit of adequate environmental monitoring.
Keywords: Environmental Impact Assessment, Environmental Monitoring, Sustainable Development.

INTRODUCTION

Sustainability of the environment requires a constant and regular observation of on-going activities within the environment. Some of these activities could be natural or anthropogenic in nature, but influences man and other living things in the environment. Precisely, sustainable development is “a new way of development that supports human progress for the planet and for a long-term future” (http:www.un.org?geninfo/bp/anviro.html)[1]

Such sustainability is maintained through an enhanced environmental standard, using documents that set the rules, guidelines and numeric values defined by the involved parties, and regulating activities or results of activities which either have or are likely to have impact on the state of the environment, hence the need for environmental monitoring.

Environmental monitoring is geared toward sustaining the environment. It can be defined as the systematic observation of the state of the environment and of the factors influencing it, with the purpose to forecast changes to the state of the environment, and to provide initial data for planning documents, programs and projects. [2] define Environmental Monitoring as an explicit and systematic checking of outputs and outcomes related to a management initiative in order to understand what works and what does not work and to determine needed modifications to enhance effectiveness.

In order to carry out a real and effective environmental protection activity, the continuous monitoring of its quality and the level of pollutants discharged or already present in the environment is an objective necessity [3].

This conscious effort is intended to balance the ecosystem, from where all economic activities evolve from, in order to protect the environment from irreparable or irreversible damage.

Observations of the pre-industrial revolution era indicates a relatively less stressful ecosystem because of non-complicated economic system, and environmental watch or monitoring was not for any specific purpose, but rather to document event occurrences such as earthquake, atmospheric disturbances, i.e. typhoons, cyclones, tornadoes etc., agricultural bounties and famines whereby their cyclic re-occurrence are predicted for man's future benefits.

POST INDUSTRIAL REVOLUTION

The era of industrial revolution raised man's ingenuity in conquering what is perceived to be economic problems of the environment, with the invention of machines and also medicines for improved health care.

Mineral exploration and exploitation increased at a large scale, leading to large scale use of fossil fuel, large scale agricultural practice emerged, as well as the emergence of large urban area, as a result of astronomical increase in world population. Also within this period, the urge to subdue outer space was very strong among the leading powers.

In an effort to making life more comfortable for the human society, the environment started experiencing increase pressure, which includes pollution, smog, noise, flood and erosion, solid waste dumps, as well as the depletion of available natural resources, which are not just limited to the a nation alone, but the whole world.

It is in this respect that environmental problems have awakened global fear and responses or reactions, hence the United Nations Organization (UNO) through its Environmental Programme (UNEP) established in 1972, has declared that "to defend and improve the environment, the present and future generations has become an imperative goal for mankind"[4]

Furthermore, the UNESCO has carried out programs on man and the Biosphere (MAB), which studied among other things, the effects of environment quality on man. Studies carried out in this program called attention in particular to different environmental hazards (natural and manmade) and the damage and loss of human life associated with environmental quality situations.

These culminated into the UNO declaring and celebrating the 5th Day of June every year as World Environment Day. This is meant to draw the attention of governments, non-governmental organizations development decision makers, and all other people in various countries of the world to the "state of the environment and various environmental issues and problems threatening mankind today. Due to these global environmental problems, it became necessary to monitor the global environment in order to understand the processes at global level, and so preserve the world for mankind.

ENVIRONMENTAL PROCESSES

It is man's interferences with the environmental processes, man's dependence on environmental resources and man's management or mismanagement of the wastes from his use of the resources that mostly affect our environmental quality.

Man has through his interferences and exploitations introduced more gases, dumped wastes, diverted water courses, created big water bodies and surfaces, altered weather conditions and micro-climates or encouraged devastating wind erosion, flooding, gullying, pollution of air, water or soils, or even aided the extension of desert conditions beyond their traditional boundaries.

[5] observed that "man's interventions in the environment is to exploit available resources, which include different land resources, forest resources, water resources, atmospheric resources and landscape resources and landscape resources."

Our environment provide sources of our food, the resources for our shelter, clothing, industries, constructions, health care and treatments, local crafts and implements and for satisfying most of our basic needs and many of our exotic needs. The large size of Nigeria population implies that we would have to make considerable impact on our environment in our effort to exploit our resources and achieve high and sustained development, the same way USA, Canada, Britain, France, Russia, Japan, China, etc. will do. This definitely will have great impact on the global environment.

THE RATIONALE OR REASON FOR ENVIRONMENTAL MONITORING

Since we have a need for a healthy environment that is free from any form of pollution and unwanted substances, then the need for information gathering of the necessary data covering those environmental problems becomes paramount in order to help mankind manage his environment properly, with the overall aim of protecting the environment and preventing it from rampaging pollution, so as to judge the current state of environment accurately. The collation of resources data and its impact on resource use marks the beginning of monitoring process in the environment. Resources such as water usage, waste generation, energy generation and usage, property management and construction, as well as new production lines, require careful monitoring in order to ascertain the sustainability of production quality.

In the industries, raw material inputs should be monitored regularly to ensure the usage of the right types of raw material, and that the production components of the sectors within the system work optimally.

Proper monitoring helps to reveal shortcomings in the production system, and thus indicate where maintenances or corrective measures should be applied in order to minimize waste in the production sector of the environment. This, therefore implies that the essence of environmental monitoring is to achieve process optimization through the understanding and interpretation of processes, either artificial or natural in nature, such as stream flow, air emission discharges from industries, energy flow etc. [6] observed that the global environment has no boundary, and an acceptable standard is the yardstick in determining the extent of impact that an environment might be experiencing, which is measured against an externally recognized standard, such as the International Standard Organization (ISO 1400).

The baseline supplied by the ISO, determines whether the observable environmental performances meets the international acceptance limit, in other words whether the activities of the environment are considered to be environmentally friendly. The need therefore arises to identify indicators within the environment that will

enable us monitor environmental trends and process with a view to achieving aims and objectives of a healthy environment.

The core indicators accepted globally include air quality, green-house gas emission, ozone depletion, freshwater quality and allocation, land cover and land use etc. and the characteristics associated with these indicators include;

1. The determination of the state of our environment in terms of quality whether improving or deteriorating.
2. Evaluation of the desired effect of policies, laws and other environmental actions.
3. To identify new issues or emerging trends.
4. To make input into the development of environmental policies.

It is obvious that global environmental issues like the destruction of the ozone layer and global warming cannot be resolved by a country, no matter how highly such country is place. Therefore, it is obvious that the co-operation of all countries is increasingly necessary to protect the environment. Environmental monitoring is supposed to be a concerted effort of all countries in other to protect world environment. The need for such co-operation enhanced the observation of, [7] that "measuring and monitoring many aspects of the atmosphere help in building a better picture of atmospheric structure and function. These aspects relate to climatic and meteorological properties such as wind direction and speed, temperature, rainfall and pressure, or focus on atmospheric composition such as the concentration of a particular pollutant at a particular point in time and space, in order to assess the background trends in pollutant concentration over recent times".

As a result of environmental monitoring, [8] noted that "the introduction of agricultural activities into Mexico's Sonora desert has diminished 97% of the region's water resources, thus decreasing the migratory bird populations from 233,000 in 1970 to less than 100,000 recently. Also, the nearly complete destruction of the Aral sea of 64,000km^2 in Central Asia, once the fourth largest in-land sea in the world, is one of the most disastrous human induced land use/land covers (LULCs) which resulted from the diversion of the two feeder rivers (the Amu Darya and the Syr Darya) of the Aral Sea for irrigation of cotton fields and rice paddies. This diversion resulted in loss of the surrounding wet lands of over 530,000 ha, 135 mammal species, and 215 migrant bird species".

It is therefore imperative that sustainable management of natural resources requires that ecological goods and services be used to meet both current and future generation's needs by recognizing and adapting the inevitable biophysical limitations of interdependences. For example increasing the amount of land, water and nitrogen fertilizers used to meet the ever-increasing food consumption, which in turn increases environmental degradation that leads to an unsustainable cycle. Thus, environmental degradation makes it more difficult to meet our basic human needs of food and clean water in the long-term. Construction of dams like Kanji for power has put the south - south part of Nigeria into great danger especially during high rainfall years. The excess water release accentuates flooding downstream.

ENVIRONMENTAL POLICIES AND REGULATIONS

In many countries of the world, including Nigeria, policies are declared and regulations are made regarding environmental quality, standards and protection and environmental sanitation.

At the international level, several environmental regulations are made, especially those concerning industrial standards and quality/safety of goods and products that enter the world market, dangerous waste disposal, oil spillage and pollution, exploitation of endangered or rare animal, including birds and fishes, or tree, that is flora and fauna species, and utilization of the world's wetlands, the deserts, savannahs and the biosphere generally. The number of international environmental accords has exploded as countries awaken to the trans boundary and global ecological threats. The UN Environmental Programme (UNEP) estimates now that there are now more than 500 international treaties and other agreements related to the environment, more than 300 of them negotiated in the last 30 years. But reaching agreement is only first step. The lager challenge is seeing that the ideals expressed in them become reality. What is needed is not agreements but a commitment to breathe life into the hundreds of existing accords by implementing and enforcing them [9]

This is where advance or developed counties have failed. They still dump substandard vehicles, electronics, toxic waste, etc. into developing countries. They exploit resources in most environmental unfriendly manners. Shell activity in Ogoniland, Koko toxic dump saga, gas flaring in all oil exploration sites in Nigeria, pollution via spillage, lack of respect for vegetation are some of anti-environment activities of developed nation that champion sustainable development. These environmental unfriendly attitudes must stop; this is where environmental monitoring comes in.

The policies and regulations are generally meant to safeguard the wellbeing of the various environments, natural and human, and their elements such as land, air, water, soil and vegetation, as well as the human and animal populations, and their habitats and resources.

In 1983, the Nigerian government passed a bill-legislation on environmental protection in the country.

The law set up a Federal Environmental Protection Agency (FEPA), which was empowered by law to lay down standards for the control of the Nigerian environment. The agency was also to protect the public health and enhance the quality of water, air and other aspects of the environment.

These policies and regulations is a conscious effort to ensure that the environment is sustained for future generation whereby expected hazards will be reduced to the barest minimum level.

A NEED FOR ENVIRONMENTAL AUDITING

Environmental Impact Assessment (EIA) is the mandatory assessment of the compliance of planned activities, such as planning documents, programs and projects, with environmental protection requirements and with the principles of sustainable development with the aim of determining the optimum solution.

On the other hand, environmental audit is the assessment of the compliance of environmental administration and performance of an operating business with environmental protection requirements, with sound environmental practice in general, and with the principles of sustainable development.

Environmental audits serve as a tool and an aid to test the effectiveness of environmental efforts at local level through a systematic, independent internal interview, to check whether the results of environmental work tally with the targets, and also focuses on whether the methods used to achieve goals are effective.

Ideally therefore, the work of an environmental audit is a study of documents and reports to see whether there are any deviations between targets and results in order to confirm whether or not the environmental targets have been attained.

During a typical environmental audit, a team of qualified inspectors, either employees of the organization being audited or contractor personnel, conducts a comprehensive examination of a plant, project or other facility to determine whether it is complying with environmental laws and regulations or not.

The auditors using checklists and audit protocols, and relying on professional judgment and evaluations of site specific conditions, the team systematically verifies compliance with applicable requirements, and may also

Have to evaluate the effectiveness of systems in place to manage compliance and assess the environmental risks associated with the facilities operation.

USEFULNESS OF ENVIRONMENTAL MONITORING.

Environmental monitoring enhances the correction of an identified environmental problem for a better environment. It encourages optimal use of resources and avoidance of waste in order to reserve the same resource for future generation.

Ecosystem management is a new brand of conservation, and its ultimate aim is to enhance and to ensure the diversity of species, communities, ecosystems, and landscapes.

[10] Defines ecosystem management as "that which integrates scientific knowledge of ecological relationships within a complex socio-political and values framework toward the general goal of protecting native ecosystem integrity over the long-run'. This definition touches on what is seen as a paradigm in biodiversity conservation from nature centered, exclusive, protected areas, toward conservation centered more on people and communities.

In this respect therefore, measurement and monitoring work responds to a need to know more about something in particular, especially, when a researcher has a particular problem or issue in mind and this provides the focus for the measurement and monitoring activity a be conducted.

It was observed that environmental pollution in Japan started in her quest for industrialization since the Meiji period (1868-1912). In the 1960s, diseases caused by factory emitted water and air pollution were found in areas through Japan. The strict environmental protection measures that were subsequently implemented have reduced pollution caused by such emissions. Hence the governor of Kumamoto Prefecture declared the mercury levels in fish and shellfish from Minamata Bay safe for consumption on July 29, 1997. The governor's declaration marked the complete removal of the net that had for 23 years prevented mercury polluted fish in the bay from entering the sea in an effort to curb the environmentally induced malady known as Minamata disease. This is the effort of monitoring program that has led to improved environmental condition that is safe from previous pollution condition. Japan actually experienced a number of serious forms of environmental pollution from 1960s to the 1970s. These forms of pollution occurred as a result of the priority placed on rapid economic growth to the neglect on the standards of living of the people, therefore down playing to protect people's health and safety. The consequences led to Japan's setting strict regulations to protect the environment from the 1960s onward.

Hence, the 1993 Basic Law for Environmental Pollution control that was replaced by the Basic Environmental Law, enacted to facilitate implementation of comprehensive and systematic measures to protect the environment. In the same vein, the Waste Management and Public Cleansing Law as revised in June 1997, imposes stiff penalties on illegal dumping, but the occurrence of several large volume cases in fiscal 2003 and

2004 prompted the Ministry of Environment to increase the number of staff assigned to waste and recycling monitoring.

Japan's programmed environmental monitoring effort led the country to achieve its target for dioxin emission reduction in 2004, when emissions were estimated to be approximately 95% less than those in 1997. Daily dioxin in take has also been steadily decreasing and is now estimated to be less than the tolerable daily intake level of 4 pictograms per kilogram of body weight (Japan Fact Sheet 2008).

It has also been observed that a comparative view of the years 1972, 1987 and 2000, while monitoring the land use and land cover (LULC) changes in Turkey's Amik plain, indicated that the Amik lake and its surrounding wetlands covered 5325ha in 1972 and were annihilated completely in 1987 as a result of large scale campaign to increase the amount of crop lands used for food production in the Amik Plain in the 1940s when the Amik lake was channeled into the Orontes river. The increase in crop lands took place at the expense of the irreversible losses of the lake and its related wetlands. Hence, losses of vital ecosystem goods and services ranging from biodiversity to regulation of hydrological cycle used to be provided for the region.

ADEQUATE ENVIRONMENTAL MONITORING

Environmental resources abound all over the world, and its exploitations require some technical knowledge. The idea of exploitation is a project, which ideally must have a plan. The plan will necessitate Environmental Impact Assessment, which is a pointer to the impact or effect of the project on the environment.

Adequate environmental monitoring includes identifying predicted and unfathomed challenges to the environment and human as a result of the project. In most part of the world especially the developing countries, standards are compromise by monitors. For instance, International standard for monitoring the environment for sustainable development shows that plan for projects is very important aspect of the project. During the planning stage baseline values of the project is established. These will direct monitors in the future, without which monitoring or EIA will be useless.

Monitoring of the environment in and around the project site during the implementation phase will trigger corrective actions, which makes it a dynamic activity as oppose to passive collection of data [11]. According to SIDA EIA guideline, [12] after the implementation phase, monitoring should be carried out for evaluation of the project success or to certify that the overall project does not have any adverse environmental impacts. [13] And [14] suggested that monitoring should not be stopped immediately after the project, because there may be lags in time before project effect are felt and noticed.

Adequate or Effective monitoring in developing nations and indeed Africa should be backed up with a strong legislation and political will. Environmental issues are not issues to be toiled with. Therefore qualified trust worthy persons should man or take responsibility of monitoring project sites. Furthermore developed countries should know that environment is an open system, therefore what happened in one developing nation can affect thing in a developed country or countries. Their investment and personnel's can also be affected. So, they and their representatives should not in any way influence monitoring reports by influencing monitors or government officials and agencies to report favourably while otherwise.

Environmental monitoring alerts people to adverse or unexpected danger resulting from a project, it will also notify populace about out breaks emanating from a project action, and therefore its report should not be ambiguous, rather in terms understandable by commoners. The report should include suggestions and recommendation made on the project and the willingness or otherwise of the firm or project involved. These should be done within the ambit of international standard. Which implies that substandard products, unimaginable working condition, double standards should be eliminated. The reports should be made know to UN organ responsible to environmental issues, this should without fail recommend sanction to erring firms and nations.

CONCLUSION

Increasing population and the noticeable resultant resources scarcity encouraged explorations of resources around the world that awakened the framework for global system of observation stations that emerged, providing an important basis for understanding the world today. The historical goal of global monitoring has continued through the application of a range of technologies associated with engineering; telecommunications and the computer.

Also, new technologies such as Aerial Photography, Remote Sensing and Global Positioning Systems (GPSs) have greatly improved the potential to continuously monitor the global ecosystem, sometimes having the advantage of linking the past and present human environment interactions, and open up the opportunity to assess the potential impacts of human actions and activities and create a more sustainable future.

This is therefore an indication that the effects of poor environmental management exposes the changing trend of the environment, and also the need for environmental monitoring techniques that will enhance

an improved environmental conditions that is safe from previous pollutions

REFERENCE

(1) *http://www.un.org?geninfo/bb/anviro.html.*
(2) Philip, D. and I.M. Bruce (2009) *Environmental Change and Challenge.* Oxford University Press. Ontario, Canada.
(3) Minea, E.M. (2012) Protectia Mediului – Suport de curs pentru anul 1 – Semestrul 1, Uni. Babes – Bolyai Cluj Comunicarii, Spec: Admin. Publica, Cluj- Napoca. – Napoca, Facultatea de Stiinte Politice, Admin. si ale.
(4) UN, (2001) Special Session to review and appraise implementation of *The Habitat Agenda Worldwide:* Istanbul +5 – 6-8, June.
(5) Lemly, A.D., K.T. Kingsford and J.R. Thompson (2000) Irrigated Agriculture and Widelife Conservation: Conflict on a global Scale. *Environmental Management.* 25:485- 512.
(6) Ukpong, I.E. (2009) *Perspective on Environnemental Management.* System Club Inc. Uyo, Nigeria.
(7) Huggett, R.J, R.A. Kimerle, R.A Mehrle, P.M. Junior and H.L. Bergman (1992) Biomarkers: Biochemical, Physiological, and Histological Markers of Anthropogenic Stress. Boca Ration, FL: Lewis Publishers.
(8) http://www.animals.mon.me/endanger-species-arizona-border-7750.html
(9) Mastny, L., and H. French (2002) Crime of (a) global nature. Worldwatch (September - October): 12-13.
(10) Grumbine, R.E. (1997) Reflections on "What is ecosystem management?" Conservation Biol. 11, 44-47.
(11) World Bank, (1996b) Environmental Performance monitoring and supervision. Washington, DC, Environmental Department, the World Bank: 8
(12) SIDA, (1998) Guideline for EIA, in International Development cooperation. Stockholm, Dept. of Natural Resources and Environment, SIDA: 51
(13) Segnestam, L. (1999) Environmental Performance Indicators. A Second Edition Note. Washington, DC, the World Bank: 38
(14) Danida (1999). *Environmental Assessment for Sustainable Development*. Copenhagen,Ministry of Foreign Affairs, Danida**:** 161.